AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §§1251 *et seq.*; the "CWA"),

EnviroSystems, Inc.

is authorized to discharge from the facility located at

One Lafayette Road
Hampton, New Hampshire 03842

to receiving waters named

Taylor River (Hydrologic Unit Code: 01060003)

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on the date of signature.*

This permit and the authorization to discharge expires at midnight, five (5) years from the effective date.

This permit supersedes the permits issues on January 15, 1998.

This permit consists of 7 pages in Part I including effluent limitations, monitoring requirements, and 35 pages in Part II including General Conditions and Definitions.

Signed this day of

_____

Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency (EPA)
Region I
Boston, Massachusetts

* If comments are received during Public Notice the permit will become effective 60 days after signature. If comments are not received the permit will become effective on the date of signature.

DRAFT

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge from outfall Serial Number 002 (culture cooling water and culture flow through water) to the tidal Taylor River. Such discharges shall be limited and monitored by the permittee as specified below. Samples taken in compliance with the monitoring requirements specified below shall be taken at a location that provides a representative analysis of the effluent prior to mixing with any wastestreams authorized to be discharged under NPDES permit number NH0022985.

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Average Monthly	Maximum Daily	Measurement Frequency	Sample Type
Flow; MGD	Report	0.004	Continuous	Recorder[1]
TSS; mg/L	Report	50	1/Week	Grab
pH Range[2]; Standard Units	6.5 to 8.25 (See **I.E.**1.a.)		Daily	Grab
Fecal Coliform[2,3]; Colonies/100 ml	14	Report	5/Week	Grab
Enterococci bacteria[2,3]; Colonies/100 ml	Report	Report	2/Week	Grab
Total Residual Chlorine[4] mg/L	0.75	1.0	2/Day	Grab (When in use)
Ammonia Nitrogen as Nitrogen; mg/L	21	Report	2/Week	Grab
Whole Effluent Toxicity				
LC50[5,6,7]; Percent	---	100	1/Quarter	24-Hour Composite
Total Recoverable Cadmium[8]; mg/L	---	Report	1/Quarter	24-Hour Composite
Total Recoverable Copper[8]; mg/L	---	Report	1/Quarter	24-Hour Composite
Total Recoverable Lead[8]; mg/L	---	Report	1/Quarter	24-Hour Composite
Total Recoverable Nickel[8]; mg/L	---	Report	1/Quarter	24-Hour Composite
Total Recoverable Zinc[8]; mg/L	---	Report	1/Quarter	24-Hour Composite

See page 3 for explanation of superscripts

EXPLANATION OF SUPERSCRIPTS TO PARTS I.A.1. on page 2:

(1) The effluent flow shall be continuously measured and recorded using a flow meter and totalizer.

(2) State certification requirement.

(3) Fecal coliform and enterococci bacteria shall be sampled concurrently. The average monthly values for fecal coliform and enterococci shall be determined by calculating the geometric mean. Not more than 10 percent of the collected samples shall exceed a most probable number (MPN) of 43 colonies per 100 ml for a 5-tube decimal dilution test. All fecal coliform and enterococci bacteria data collected must be submitted with the Monthly Discharge Monitoring Reports (DMRs).

(4) When in use, Total Residual Chlorine shall be tested **in outfall 002** using the Amperometric titration or the DPD spectrophotometric method. The EPA approved methods are found in Standard Methods for the Examination of Water and Wastewater, 18th Edition or subsequent edition, Method 4500-Cl E or Method 4500-Cl G or U.S.E.P.A. Manual of Methods of Chemical Analysis of Water and Wastes, Method 330.5. The minimum level (ML) for total residual chlorine is defined as 20 ug/l. Sample results of 20 ug/l or less shall be reported as zero on the DMRs.

(5) The permittee shall conduct 48-hour static acute toxicity tests **on outfall 002** using Mysid Shrimp (Mysidopsis bahia) and Inland Silversides (Menidia beryllina). During the calendar year, toxicity test samples shall be collected and tests completed during the quarters ending March 31st, June 30th, September 30th and December 31st. Results are to be submitted by the 15th day of the month following the end of the quarter sampled.

(6) This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical specific limits, if the results of the toxicity tests indicate the discharge causes an exceedance of any water quality criterion. Results from these toxicity tests are considered "new information" and the permit may be modified as provided in 40 Code of Federal Regulations (CFR) §122.62(a)(2).

(7) "LC50" is defined as the concentration of wastewater that causes mortality to 50 percent (%) of the test organisms. The "100 percent limit" is defined as a sample which is composed of 100 percent effluent. The limit is considered to be a maximum daily limit.

(8) For each toxicity test, the permittee shall report on the appropriate DMR the concentrations of these five (5) metals (Cadmium, Copper, Lead, Nickel and Zinc) found in the 100 percent effluent sample. Also, the permittee should note that all metals results must still be reported with the appropriate toxicity test report.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

2. The permittee shall notify EPA and the State within 24-hours upon the occurrence of a water quality induced mortality of greater than 25 percent in any aquatic species under

culture at the facility in accordance with reporting requirements in Part II.D.1.e. This requirement applies only to cultures directly connected to the discharge.

3. The discharges shall not cause a violation of the water quality standards of the receiving water.

4. The permittee shall not discharge into the receiving water any pollutant or combination of pollutants in toxic amounts.

5. The discharges shall be adequately treated if necessary to ensure that the surface water remains free from pollutants in concentrations or combinations that settle to form harmful deposits or float as foam, oil & grease, debris, scum or other visible pollutants. Any necessary treatment shall ensure that the surface waters remain free from pollutants which produce odor, color, taste or turbidity in the receiving water which is not naturally occurring and would render it unsuitable for its designated uses.

6. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe (40 CFR §122.42):

   a. That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"

      (1) One hundred micrograms per liter (100 ug/L);

      (2) Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

      (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or

      (4) Any other notification level established by the Director in accordance with 40 CFR §122.44(f) and New Hampshire regulations.

   b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"

      (1) Five hundred micrograms per liter (500 ug/L);

      (2) One milligram per liter (1 mg/L) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or

(4) Any other notification level established by the Director in accordance with 40 CFR §122.44(f) and New Hampshire regulations.

c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.

7. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable standard or limitation promulgated or approved under sections 301(b)(2)(C) and (d), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

a. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

b. Controls any pollutants not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

B. RESIDUALS

The permittee shall comply with all existing federal, state and local laws and regulations that apply to the reuse or disposal of industrial residuals such as those found in the culture tanks. These include but are not necessarily limited to 40 CFR Section 257 and Env-Ws 800.

C. MONITORING AND REPORTING

Monitoring results shall be summarized for each calendar month and reported on separate DMRs postmarked no later than the 15th day of the month following the completed reporting period.

Signed copies of all DMRs and all other reports required herein, shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, Massachusetts 02114-8127

Duplicate signed copies of all reports required herein shall be submitted to the State at:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095

D. SPECIAL CONDITIONS

1. Effluent diffusers shall be maintained when necessary to ensure proper operation. Proper operation means that the plumes from each port will be balanced relative to each other and that they all have unobstructed flow. Maintenance may include dredging in the vicinity of the diffuser, clean out of solids in the diffuser header pipe, removal of debris and repair/replacement of riser ports and pinch valves.

2. Any necessary maintenance dredging must be performed only during the marine construction season authorized by the New Hampshire Fish & Game Department and only after receiving all necessary permits from the NHDES Wetlands Bureau, U.S. Coast Guard, U.S. Army Corps of Engineers, etc.

3. To determine if maintenance will be required the permittee shall have a licensed diver or licensed marine contractor inspect and videotape the operation of the diffuser. The inspections and videotaping shall be performed in accordance with the following schedule.

   a. Every year if no pinch valves have been installed on the riser ports; or
   b. Every two years if pinch valves have been installed on the riser ports.

4. Copies of a report summarizing the results of each diffuser inspection shall be submitted to EPA and NHDES WD within 60 days of each inspection. Where it is determined that maintenance will be necessary, the permittee shall provide the proposed schedule for the maintenance.

E. STATE PERMIT CONDITIONS

1. The permittee shall comply with the following conditions which are included as State Certification requirements.

   a. The pH range of 6.5-8.0 standard units (S.U.) must be achieved in the final effluent unless the permittee can demonstrate to NHDES: (1) that the range should be widened due to naturally occurring conditions in the receiving water or (2) that the naturally occurring source water pH is unaltered by the permittee's operations. The scope of any demonstration project must receive prior approval from NHDES. In no case, shall the above procedure result in pH limits less restrictive than any applicable federal categorical effluent limitation guidelines regulations.

   b. ESI is responsible for immediately notifying the New Hampshire Department of Environmental Services, Watershed Management Bureau, Shellfish Section of possible high bacteria/virus loading events from its facility. Such events include:

i. Any lapse or interruption of normal operation of the facility's effluent disinfection system, or other event that results in discharge of effluent that has not undergone full treatment as specified in the NPDES permit; or

ii. Daily flows in excess of the facility's average daily design flow of 0.01 MGD; or

iii. Daily post-disinfection effluent sample results of greater than 14 fecal coliform cts/100ml. Notification shall also be made for instances where NPDES-required bacteria sampling is not completed, or where the results of such sampling are invalid.

Notification to the NHDES Shellfish Program shall be made using the program's 24-hour pager. Upon initial notification of a possible high bacteria/virus loading event, NHDES Shellfish Program staff will determine the most suitable interval for continued notification and updates on an event-by-event basis.

2. This NPDES Discharge Permit is issued by the U.S. Environmental Protection Agency under Federal and State law. Upon final issuance by the EPA, the NHDES may adopt this permit, including all terms and conditions, as a State permit pursuant to RSA 485-A:13.

Each Agency shall have the independent right to enforce the terms and conditions of this Permit. Any modification, suspension or revocation of this Permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of the Permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation.

MARINE ACUTE
TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Mysid Shrimp (Mysidopsis bahia) definitive 48 hour test.**
- **Inland Silverside (Menidia beryllina) definitive 48 hour test.**

Acute toxicity data shall be reported as outlined in Section VIII.

II. METHODS

Methods to follow are those recommended by EPA in:

Weber, C.I. et al. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, Fourth Edition. Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH. August 1993, EPA/600/4-90/027F.

Any exceptions are stated herein.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for the chemical and physical analyses. The remaining sample shall be dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual oxidants (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium

thiosulfate to reduce 1.0 mg/L chlorine. A thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) should also be run.

All samples held overnight shall be refrigerated at 4°C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected at a point away from the discharge which is free from toxicity or other sources of contamination. Avoid collecting near areas of obvious road or agricultural runoff, storm sewers or other point source discharges. An additional control (0% effluent) of a standard laboratory water of known quality shall also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a conductivity, salinity, total suspended solids, and pH similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S).** Written requests for use of an alternative dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency-New England
JFK Federal Building (CAA)
Boston, MA 02203

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

EPA New England requires tests be performed using four replicates of each control and effluent concentration because the non-parametric statistical tests cannot be used with data from fewer replicates. The following tables summarize the accepted Mysid and Menidia toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND RECOMMENDED EFFLUENT TOXICITY TEST CONDITIONS FOR THE MYSID, MYSIDOPSIS BAHIA 48 HOUR TEST[1]

1.	Test type	Static, non-renewal
2.	Salinity	25ppt ± 10 percent for all dilutions by adding dry ocean salts
3.	Temperature (°C)	
	20°C ± 1°C or 25°C ± 1°C	
4.	Light quality	
	Ambient laboratory illumination	
5.	Photoperiod	
	16 hour light, 8 hour dark	
6.	Test chamber size	250 ml
7.	Test solution volume	200 ml
8.	Age of test organisms	1-5 days
9.	No. Mysids per test chamber	10
10.	No. of replicate test chambers per treatment	4
11.	Total no. Mysids per test concentration	40
12.	Feeding regime	Light feeding using concentrated Artemia nauplii while holding prior to initiating the test
13.	Aeration[2]	None

14.	Dilution water	Natural seawater, or deionized water mixed with artificial sea salts
15.	Dilution factor	$\geq$ 0.5
16.	Number of dilutions[3]	5 plus a control. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
17.	Effect measured	Mortality - no movement of body appendages on gentle prodding
18.	Test acceptability	90% or greater survival of test organisms in control solution
19.	Sampling requirements	For on-site tests, samples are used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must be first used within 36 hours of collection.
20.	Sample volume required	Minimum 1 liter for effluents and 2 liters for receiving waters

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Footnotes:

1. Adapted from EPA/600/4-90/027F.

2. If dissolved oxygen falls below 4.0 mg/L, aerate at rate of less than 100 bubbles/min. Routine D.O. checks are recommended.

3. When receiving water is used for dilution, an additional control made up of standard laboratory dilution water (0% effluent) is required.

EPA NEW ENGLAND RECOMMENDED TOXICITY TEST CONDITIONS FOR THE INLAND SILVERSIDE, MENIDIA BERYLLINA 48 HOUR TEST[1]

1.	Test Type	Static, non-renewal
2.	Salinity	25 ppt ± 2 ppt by adding dry ocean salts
3.	Temperature	20°C ± 1°C or 25°C ± 1°C
4.	Light Quality	Ambient laboratory illumination
5.	Photoperiod	16 hr light, 8 hr dark
6.	Size of test vessel	250 mL (minimum)
7.	Volume of test solution	200 mL/replicate (minimum)
8.	Age of fish	9-14 days; 24 hr age range
9.	No. fish per chamber	10 (not to exceed loading limits)
10.	No. of replicate test vessels per treatment	4
11.	total no. organisms per concentration	40
12.	Feeding regime	Light feeding using concentrated Artemia nauplii while holding prior to initiating the test
13.	Aeration[2]	None
14.	Dilution water	Natural seawater, or deionized water mixed with artificial sea salts.
15.	Dilution factor	≥ 0.5

16. Number of dilutions[3]	5 plus a control. An additional dilution at the permitted concentration (% effluent) is required if it is not included in the dilution series.
17. Effect measured	Mortality-no movement on gentle prodding.
18. Test acceptability	90% or greater survival of test organisms in control solution.
19. Sampling requirements	For on-site tests, samples must be used within 24 hours of the time they are removed from the sampling device. Off-site test samples must be used within 36 hours of collection.
20. Sample volume required	Minimum 1 liter for effluents and 2 liters for receiving waters.

Footnotes:

1. Adapted from EPA/600/4-90/027F.

2. If dissolved oxygen falls below 4.0 mg/L, aerate at rate of less than 100 bubbles/min. Routine D.O. checks recommended.

3. When receiving water is used for dilution, an additional control made up of standard laboratory dilution water (0% effluent) is required.

VI. CHEMICAL ANALYSIS

At the beginning of the static acute test, pH, salinity, and temperature must be measured at the beginning and end of each 24 hour period in each dilution and in the controls. The following chemical analyses shall be performed for each sampling event.

Parameter	Effluent	Diluent	Minimum Quantification Level (mg/L)
pH	x	x	---
Salinity	x	x	PPT(o/oo)
Total Residual Oxidants*1	x	x	0.05
Total Solids and Suspended Solids	x	x	

Ammonia	x	x	
	0.1		
Total Organic Carbon	x	x	
	0.5		
Total Metals			
Cd	x		0.001
Cr	x		0.005
Pb	x		0.005
Cu	x		0.0025
Zn	x		0.0025
Ni	x		0.004
Al	x		0.02

Superscript:

*1 Total Residual Oxidants

Either of the following methods from the 18th Edition of the APHA Standard Methods for the Examination of Water and Wastewater must be used for these analyses:

-Method 4500-Cl E Low Level Amperometric Titration (the preferred method);
-Method 4500-CL G DPD Photometric Method.

or use USEPA Manual of Methods Analysis of Water or Wastes, Method 330.5.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration

An estimate of the concentration of effluent or toxicant that is lethal to 50% of the test organisms during the time prescribed by the test method.

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See flow chart in Figure 6 on page 77 of EPA 600/4-90/027F for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See flow chart in Figure 13 on page 94 of EPA 600/4-90/027F.

VIII. TOXICITY TEST REPORTING

The following must be reported:

- Description of sample collection procedures, site description;
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody; and
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicity test data must be included.
- Raw data and bench sheets.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Provide a description of dechlorination procedures (as applicable).

- Any other observations or test conditions affecting test outcome.
- Statistical tests used to calculate endpoints.